WHAT IS CLAIMED IS:

1. Process for the production of a rotor of a synchronous machine, containing permanent magnets, the rotor having a core of ferromagnetic steel, on and connected to which core are permanent magnets which in their turn are surrounded by an outer cylinder of a non-magnetizable material, and which rotor has at both axial ends a closure disk of a non-magnetizable steel with a stub shaft, wherein the core is constituted with an internal space, the process comprising:

introducing a resin mass into the internal space;

supplying said resin mass to a region of the permanent magnets by centrifuging the rotor; and

hardening of the resin mass in the region of the permanent magnets.

2. Process according to claim 1, further comprising:

heating and simultaneously running up to a centrifuging speed the rotor with the introduced resin mass, such that the resin mass is conducted outward, due to centrifugal force, from the internal space through radial channels in the core, or from the internal space through holes and longitudinal slots in the core, to the region of the permanent magnets, and the cavities present there are filled up; and

maintaining the rotor at the centrifuging speed during the hardening of the resin mass.

3. Process according to claim 1, further comprising:

arranging the permanent magnets on the core by inserting the permanent magnets with play into the outer cylinder;

arranging at each end after the introduction of the resin mass into the internal space the respective closure disk, each closure disk consisting of non-magnetizable steel with a stub shaft and the core centered in the closure disks; and

connecting the outer cylinder to the closure disks.

4. Process according to claim 1, wherein the resin mass is introduced into the internal space in the core in the form of a solid rod.

5. Process according to claim 1, wherein the resin mass contains at least one filler.

6. Process according to claim 1, wherein the outer cylinder is shrunk onto the closure disks.

7. Process according to claim 6, wherein the shrunk-on outer cylinder is connected flush to the closure disks by means of a circumferential weld seam.

8. Process according to claim 7, wherein the circumferential weld seam is pre-welded in only one pass before the centrifuging of the resin and is only completely after-welded after the hardening of the resin.

9. Process according to claim 6, wherein the outer cylinder is constituted at both ends with an inner circumferential groove and the closure disks are constituted with an outer circumferential projection and an adjacently arranged outer circumferential groove with an inserted O-ring, and the outer cylinder is shrunk onto the closure disks such that the respective outer circumferential projection of the closure disks projects into the respective inner circumferential groove, and the respective O-ring abuts the outer cylinder flush.

10. Process according to claim 1, wherein the closure disks are constituted with a cone-shaped portion directed toward the rotor interior, and are pressed into the outer cylinder, to connect with it, as far as a stop.

11. Process according to claim 1, wherein magnetic neutral zones are present in annular space portions between the core and the outer cylinder, which neutral zones

contain no permanent magnets, and the process further comprises inserting filler pieces into said annular space portions, the density of the material of the filler pieces being at least approximately equal to the density of the material of the permanent magnets.

12. Process according to claim 1, further comprising inserting a filler strip between adjacent permanent magnets.

13. Process according to claim 1, further comprising inserting a further filler strip between the permanent magnets and the inner circumferential regions of the outer cylinder lying opposite said permanent magnets.

14. Process according to claim 13, further comprising:

forming a damping cage by connecting the further filler strips at their ends to a respective flexibly constituted ring;

arranging said further filler strips around the core; and

installing the closure disks.

15. Process according to claim 1, further comprising:

producing a cage of an electrically conductive material with end rings and axially-running longitudinal rods with transverse grooves for distributing the resin;

inserting the permanent magnets into the cage; and

pushing the cage with the permanent magnets into the outer cylinder followed by adhering the permanent magnets to the outer cylinder with a provisional adhesive and thereafter pushing the core into the cage, or pushing the core into the cage and thereafter pushing the outer cylinder over the cage with the permanent magnets.

16. Process according to claim 1, further comprising stacking metal sheets on a centering tube to produce the core, the centering tube having holes for the passage of resin mass arranged in the internal space and the metal sheets having slots aligned with the holes for the further passage of the resin.

17. Process according claim 1, wherein the core is integral and is constituted with an internal space, which internal space serves as a storage space for the resin mass, and from which internal space channels are constituted running in a radial direction toward the outside of the core.

18. Process according to claim 1, wherein the core is constituted at both axial ends with a polygonal recess, each closure disk being constituted with a polygonal projection corresponding to the recesses of the core, and the process further comprises inserting the projections into the recesses during assembly of the rotor in order to form a positive connection for force transmission between the core and the closure disks.

19. Process according to claim 1, wherein the core has an outer circumferential surface constituted of polygonal shape with many planar surface portions, the dimensions of each individual surface portion being conformed to the dimensions of the permanent magnets so that a magnetic gap formed between the core and the permanent magnets arranged on the surface portions is minimized, and a predetermined transmission of torque from the permanent magnets to the core is attained.

20. Rotor containing permanent magnets, the rotor comprising:

a core of ferromagnetic steel;

an internal space running axially;

at least one permanent magnet arranged on the core;

an outer cylinder of non-magnetizable material surrounding the at least one permanent magnet; and

closure disks of non-magnetizable steel, each closure disk having a stub shaft and positively connected to the core and at least frictionally connected to the outer cylinder,

wherein after interfusing a resin at least a plurality of the cavities in the region of the permanent magnet are filled with the resin as far as the diameter of the internal space.

21. Rotor according to claim 20, wherein the outer cylinder is shrunk onto the closure disks.

22. Rotor according to claim 21, wherein the shrunk-on outer cylinder is connected flush to the closure disks by means of a circumferential weld seam.

23. Rotor according to claim 21, wherein the outer cylinder has a circumferential groove at each end, and the closure disks have an outer circumferential projection and an adjacently arranged circumferential groove with an inserted O-ring, said outer circumferential projections projecting into the respective inner circumferential groove and said O-ring abutting the outer cylinder flush.

24. Rotor according to claim 20, wherein each closure disk has a cone-shaped portion directed toward the rotor interior and has a shoulder portion serving as a stop, said closure disks being pressed into the outer cylinder and abutting it with the shoulder portion.

25. Rotor according to claim 20, further comprising:

a plurality of annular space portions between the core and the outer cylinder defining a plurality of magnetic neutral zones, said neutral zones containing no permanent magnets; and

a plurality of filler pieces arranged in the annular portions, the filler pieces having a density at least approximately the same as a density of the permanent magnets.

26. Rotor according to claim 20, further comprising a filler strip arranged between adjacent permanent magnets.

27. Rotor according to claim 20, further comprising a further filler strip arranged between the permanent magnets and the inner circumferential regions of the outer cylinder opposite to the permanent magnets.

28. Rotor according to claim 27, wherein the further filler strip consists of an electrically conducting material and, for the formation of a damping cage, are connected at their ends to a flexibly constituted ring within which the core is arranged.

29. Rotor according to claim 20, further comprising a cage of electrically conducting end rings and longitudinal rods with transverse grooves for the distribution of the resin, the permanent magnets being inserted into said cage.

30. Rotor according to claim 20, wherein the core is formed by a metal sheet packet comprising a plurality of metal sheets arranged on a centering tube, the centering tube having a plurality of holes, wherein the metal sheets have longitudinal slots running in the radial direction and aligned with the holes.

31. Rotor according to claim 20, wherein the core is integral and has an internal space from which a plurality of channels run in a radial direction to the outside of the core.

32. Rotor according to claim 20, wherein, for torque transmission from the core to the closure disks, the core has a polygonal recess at each axial end, and each closure disk has a polygonal projection projecting into the respective recess.

33. Rotor according to claim 20, wherein the core has a polygon-shaped outer circumferential surface, consisting of individual plane-surfaced surface portions, whereby the surface portions correspond to the dimensions of the permanent magnets abutting the same.

34. Rotor according to claim 20, wherein the core is formed by a metal sheet packet comprising a plurality of metal sheets and a plurality of shear bolts inserted at one end into the metal sheets and at a second